

Profile: Ed Brown and the Development of the Ontario Telemedicine Network

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A neurologist in Sudbury advises her patient in Iroquois Falls about the results of his latest magnetic resonance imaging. A nurse in Ottawa counsels a patient in Barry's Bay about the steps she should take to deal with her arthritis. A teenager living in a fly-in First Nations community 250 kilometres north-east of Lake of the Woods undergoes a diagnostic assessment by an endocrinologist based at Thunder Bay Regional Health Sciences Centre.

Only a couple of decades ago, these medical consultations and thousands of others like them that take place across Ontario every day would have required extensive – often expensive and highly inconvenient – travel. Fortunately for patients, their families and healthcare providers, such onerous journeys are swiftly becoming a thing of the past.

In their stead, the Ontario Telemedicine Network (OTN) has woven a province-spanning web of technology-enabled clinical consultation, diagnostic, education and administrative services. Today, OTN is one of the world's largest telemedicine networks. "Telemedicine ... is the delivery of health-related services and information using telecommunications technologies such as two-way videoconferencing systems and tele-diagnostic instruments such as digital stethoscopes, otoscopes and patient examination cameras" (OTN 2008). An independent, not-for-profit organization, the OTN is held up as a model in Canada and abroad of the power of e-health to enhance both care access and quality.

OTN's current success in helping to serve the healthcare needs of 12 million people spread across more than one million square kilometres (a territory larger than Spain and France combined) can make one forget that the network is a relative newcomer to the healthcare field. In fact, its comparatively brief history offers compelling insights into the roles that vision, careful research, collaboration and strategy-driven diligence play in launching, sustaining and growing effective e-health services.

OTN was officially inaugurated in 2006, the result of the merger of three pre-existing regional telemedicine networks: NORTH Network (Central and Northern Ontario), CareConnect (Eastern Ontario) and VideoCare (Southwestern Ontario). All three organizations contributed resources, expertise,



relationships and innovative processes to OTN's development.

To acquire a deeper understanding of how telemedicine in Ontario went from zero to 100 kilometres an hour in relatively short order, Longwoods interviewed Dr. Edward Brown, OTN's chief executive officer (CEO) and the founder of NORTH Network. Dr. Brown provided a history of his personal experience in NORTH Network's start-up, the subsequent development of OTN and a glimpse into the future role of OTN in supporting Ontario's healthcare system.

Phase One: 1993–2000

In 1993, Dr. Brown was dividing his time between serving as an emergency room (ER) physician in Toronto and as a consul-

tant with the Institute for Clinical Evaluative Sciences (ICES). During the little spare time that remained to him each day, he was also rolling around the germ of an idea that would profoundly reconfigure healthcare delivery in Ontario.

Ontario Telemedicine Network by the Numbers*

- Over 53,000 clinical events
- Over 9,200 education events
- Nearly 9,800 administrative events
- More than 2,700 healthcare professionals
- Over 660 sites in which programs and services have been delivered

*Most recent data: 2008–2009.

Source: Ontario Telemedicine Network.

“Begin small, but have a clear goal in mind,” Dr. Brown says, when asked about taking the first critical steps in any new healthcare venture. Back in 1993, telemedicine was, in most industrialized countries, still in its infancy. The National Aeronautics and Space Administration had made some instructive forays on Native reservations in Arizona during the 1970s, and Newfoundland and Labrador had embarked on a telemedicine network. Dr. Brown knew, however, that there was much to learn before launching any sort of meaningful service in Ontario.

The first step on NORTH Network’s journey therefore involved research. A \$67,000 grant from the Ontario Medical Association (OMA) enabled Dr. Brown and Dr. Mark Doidge to undertake a 1.5-year feasibility study. (In the early 1990s, OMA had funded Dr. Brown’s successful film *Hurry Up and Wait*, which informed patients how the ER system works.) This feasibility research addressed three foundational questions:

1. How do healthcare providers care for patients in remote locales?
2. What technology exists to connect healthcare providers and patients?
3. How are other jurisdictions in Canada and globally addressing the issue?

The report was released in 1995. It soon caught the attention of David Naylor, the then CEO of ICES, who introduced Dr. Brown to Peter Ellis and Tom Closson, the CEO and vice-president, respectively, of Sunnybrook Health Sciences Centre. Ellis and Closson quickly recognized the potential Dr. Brown had identified in his report of telemedicine’s power to advance

care delivery across Ontario. Likewise, Dr. Brown recounts, in addition to Sunnybrook, four other hospitals “saw the simple, compelling vision” he had presented and joined the infant network: Timmins, Cochrane, Kirkland Lake and, soon after, Sudbury.

For the next three years (1995–1998), “I spent my nights and weekends pulling together a robust funding proposal,” says Dr. Brown. Taking patient care as the premier aspiration, he needed to ensure each link in the “healthcare value chain” was addressed:

- The overall telemedicine strategy
- A sales strategy, including who to sell to and who had the resources to support innovation
- Issues stakeholders – providers, patients and government – truly care about
- A way for the telemedicine network to meet all the stakeholders’ requirements
- A plan to address providers’ need to earn income and to integrate telemedicine consultations into their practices

NORTH Network went live in March 1998. At that time, it relied on financial support from the five hospitals plus matching funds from the Ontario government. It comes as somewhat of a surprise to discover that the government funding came not from the health ministry but from the Ministry of Energy, Science, and Technology, which sought to promote the development and use of innovative technologies. During this first phase, the busiest medical areas were orthopedics, psychiatry and dermatology. Given that there was an utter dearth of dermatologists practising in Northeastern Ontario at the time, the inclusion of Dr. Bob Lester, a Sunnybrook dermatologist (and future executive vice-president), was a tremendous boon to patients in that underserved region.

Phase Two: 2000–2006

The year 2000 was a watershed moment for both NORTH Network and OTN’s eventual emergence. While Dr. Brown and his network colleagues joined the rest of the world in breathing a sigh of relief that Y2K’s apocalyptic spectre had failed to crush the digital age, they were faced with finding a way to deal with the end of their project funding.

Dr. Robert Williams, the medical director and the project’s lead, approached the Northern branch of the Ontario Ministry of Health and Long-Term Care (MOHLTC), which stepped up with a year of bridge funding. Following that, several other hospitals in Central Ontario joined the network, adding to its sustainability.

Next, Health Canada provided a grant to Thunder Bay Regional Hospital, and NORTH Network partnered with the hospital and Keewatinook Okimakanak Tribal Council

to conduct telemedicine consultations across communities in Northwestern Ontario. This initiative met with, in Dr. Brown's words, "an incredible response" from communities throughout that vast region. Alongside supportive band council resolutions, town hall events and local petitions for service expansion, community hospitals, education organizations, provincial and federal government funders and private sector partners all made substantial financial commitments to the network's development. Approximately \$10 million was raised, and these funds were matched by the Canada Health Infostructure Partnerships Program (CHIPP).

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In addition to stable financial backing, one of the major breakthroughs during this period was the creation of an Internet protocol (IP) data transmission network for use by all three of the province's telemedicine organizations. This development came about when Dr. Brown and his colleagues approached the nascent Smart Systems for Health Agency (SSHA). Initially cautious, SSHA eventually agreed to build a network to serve all three organizations, which thereby became the agency's "first customers." By serving as a test case for SSHA, Ontario's telemedicine pioneers were able to leverage a state-of-the-art network and save a great deal of money that would otherwise have been expended on creating an IP network from scratch.

By the time CHIPP funding ended in 2003, it was clear that the province's three telemedicine networks were making significant gains in terms of advancing healthcare delivery. "The Ontario government saw this success and the groundswell of support," Dr. Brown recalls, "and they realized that something powerful had developed in their backyard." Therefore, at the end of 2003 and beginning of 2004, MOHLTC provided separate "sustaining funding" for all three networks.

Phase Three: 2006 to Today

When Ontario's three telemedicine networks started out, they operated mostly in isolation from each other. Yet by 2004–2005, "our boundaries were encroaching and we had somewhat different technologies and business models," explains Dr. Brown. The networks' members and MOHLTC saw that the optimum solution to this growing problem was to unite the three organizations. By late 2005, more was known and understood about the risks, benefits and best practices of telemedicine; as a result, it was possible to set appropriate governance structures and operating policies.

Acting on ministry encouragement and direct support, the

three networks' leaders put their heads together and devised what, on April 1, 2006, became OTN. "Our vision was to develop the best strategy we could for improving healthcare in Ontario," Dr. Brown notes. "Given how new the field of telemedicine was, we saw a need for a lot of creativity and growth to truly deliver the value to the public. We wanted to ensure OTN wouldn't be trapped in a bureaucratic structure that would limit our development and flexibility." Harkening back to some experience in community development work in Ethiopia during the early 1990s, Dr. Brown concludes, "Social entrepreneurship and not-for-profit flexibility were essential for us."

Likewise, while regional identities were highly important, Dr. Brown and his colleagues did not want to see a regionally driven network. "We aimed at having centralized processes – which are highly efficient – with regional relationships and adoption processes."

Bringing together three organizations that had different operating processes and cultures was, however, not without its challenges. Dr. Brown underscores that because it was a "friendly merger," organizers did not want to simply jettison regional approaches. "We therefore spent an entire year trying to get 'best of breed' and to build one culture. And by and large, we have been very successful integrating our legacy organizations." The lesson in that experience, according to Dr. Brown, is that "you can achieve just about anything you want of social value, as long as you don't need to own it."

Costs and Benefits

"A single cost-benefit analysis for OTN is tough," Dr. Brown comments, "because we support so many diverse applications and providers." Nevertheless, the network recently received a \$1 million grant from Canada Health Infoway and MOHLTC to conduct a formal benefits analysis. The first step in this process is to look to users to identify why OTN has sustained value for their programs and patients and then identify the things that can be measured.

Outside any formal study, Dr. Brown observes that the clearest cost-benefit analysis involves the ministry's Northern Health Travel Grants program. "If you look at what would have been paid out by that program last year had patients travelled instead of used telemedicine, it's pretty close to the amount of our base funding." As Dr. Brown concludes, "That alone pays for us."

Dr. Brown is quick to point out, however, that the most important "savings" do not involve just dollars. "It's really about efficiency and access. In particular, it's the patients who save time and energy, as well as their families. These people love the service." Meanwhile, on the purely medical side, "it's more an intuitive business case. There's not a lot of literature out there distinctly documenting the benefits of seeing a specialist. It's always been a little challenging to compare telemedicine to the

gold standard – in-person specialist consultation – when the gold standard is itself understudied in the literature. Those are tough things to measure.”

One powerful example Dr. Brown brings forward, however, that supports the efficacy of telemedicine involves OTN’s Emergency Telestroke Service. “People are getting the clot-busting drug t-PA [tissue plasminogen activator] because of the advice of remote neurologists. They would not have had that advice otherwise, and there are clear morbidity, mortality, rehab and social costs when these people *aren’t* treated.” At present, there are 11 hospitals using remote neurologists, and there are several more coming online shortly. In May 2009, the 1,000th patient passed through the program.

Leadership Essentials

The path to e-health success is still being surveyed. Nevertheless, our conversations with Dr. Ed Brown sharply illuminated three essential features of his leadership that ensured telemedicine in Ontario did not wind up lost in the bush:

1. Clarity of vision and mission
2. Communication that is based on dialogue and fosters collaboration
3. An ability to bring the right experts and supporters together – and keep their enthusiasm stoked

Current Initiatives

OTN is on the move. Over the past fiscal year (April 1, 2008–March 31, 2009), the network increased its clinical events – one of the organization’s key measures – by 40%. Similarly, during the first quarter of 2009, OTN recorded more than a 60% growth in clinical activity over the same quarter a year earlier.

One of the network’s most promising new ventures is the personal computer (PC)-based Personal Telemedicine Service. The core component of this service is an inexpensive, PC-based videoconferencing platform, as well as a simple search engine called “Search the Telemedicine Community.” Using this portal, providers (and eventually patients) will be able to easily obtain important information, such as the names and contact information of all the cardiologists working in a particular Local Health Integration Network. In Dr. Brown’s words, “This service will make accessing information and using telemedicine cheaper, faster and more ubiquitous.”

OTN also recently managed a Telehomecare for Chronic Disease Management pilot study funded by MOHLTC and Canada Health Infoway. This study involved 800 patients

with heart failure and chronic lung disease who used remote monitoring technology and received self-management training from telehomecare nurses. PricewaterhouseCoopers Canada evaluated the results, which indicated a 65% reduction in hospitalization and a 75% drop in ER visits. The study included patients associated with eight family health teams scattered across Ontario, several of which have now embarked on a similar pilot for diabetes patients with complex disease.

The Way Forward

Looking back over the past 16 years, Dr. Brown reflects that a good deal of NORTH Network’s and OTN’s success is attributable to the clarity of the vision and mission promoted by both organizations: “We were always clear about our goal: providing better access to care and medical knowledge. As a result, health system decision-makers, hospitals, ministries and care providers easily recognized that our plans and projects would benefit their organizations and communities.” Dr. Brown concludes, “Once they saw that it had arrived and was reasonably practical to use, they unleashed their creativity and began to use telemedicine to help solve their local and regional problems.”

While technology is central to OTN’s work, “our goal has never been about technology, which we regard as an ‘enabler.’ It is about improving the healthcare system,” asserts Dr. Brown. In order to accomplish such an improvement, Dr. Brown and his OTN team advocate policy changes that will enable providers to use technology to conduct team-based, multi-point consultations.

On this front, Dr. Brown is heartened by the growing collaborations among physicians, nurses, pharmacists and other professionals. However, he counsels that more needs to be done at a policy level to support such integration and to ensure accountability for patient care – changes that, Dr. Brown reasons, might require altering Ontario’s fee-for-service insurance model. “Technology is a catalyst for change; however, once we’ve identified that it actually works, policies and systems need to evolve to support those kinds of activities.”

Over the coming years, the eyes of OTN’s members, government, healthcare providers and patients will be watching closely to see what further innovations the network brings to Ontario’s healthcare landscape. Moving forward, Dr. Brown says that OTN’s strategic plan for the next three years pivots on two essential themes: *collaboration* and *coaching*. Acting on those principles requires figuring out how to get healthcare providers to collaborate around patients’ care, and coaching patients so that they can improve their own care and stay out of the hospital.

Reference

Ontario Telemedicine Network. 2008. *Who We Are*. Author. Retrieved September 14, 2009. <www.otn.ca/en/otn/who-we-are>.